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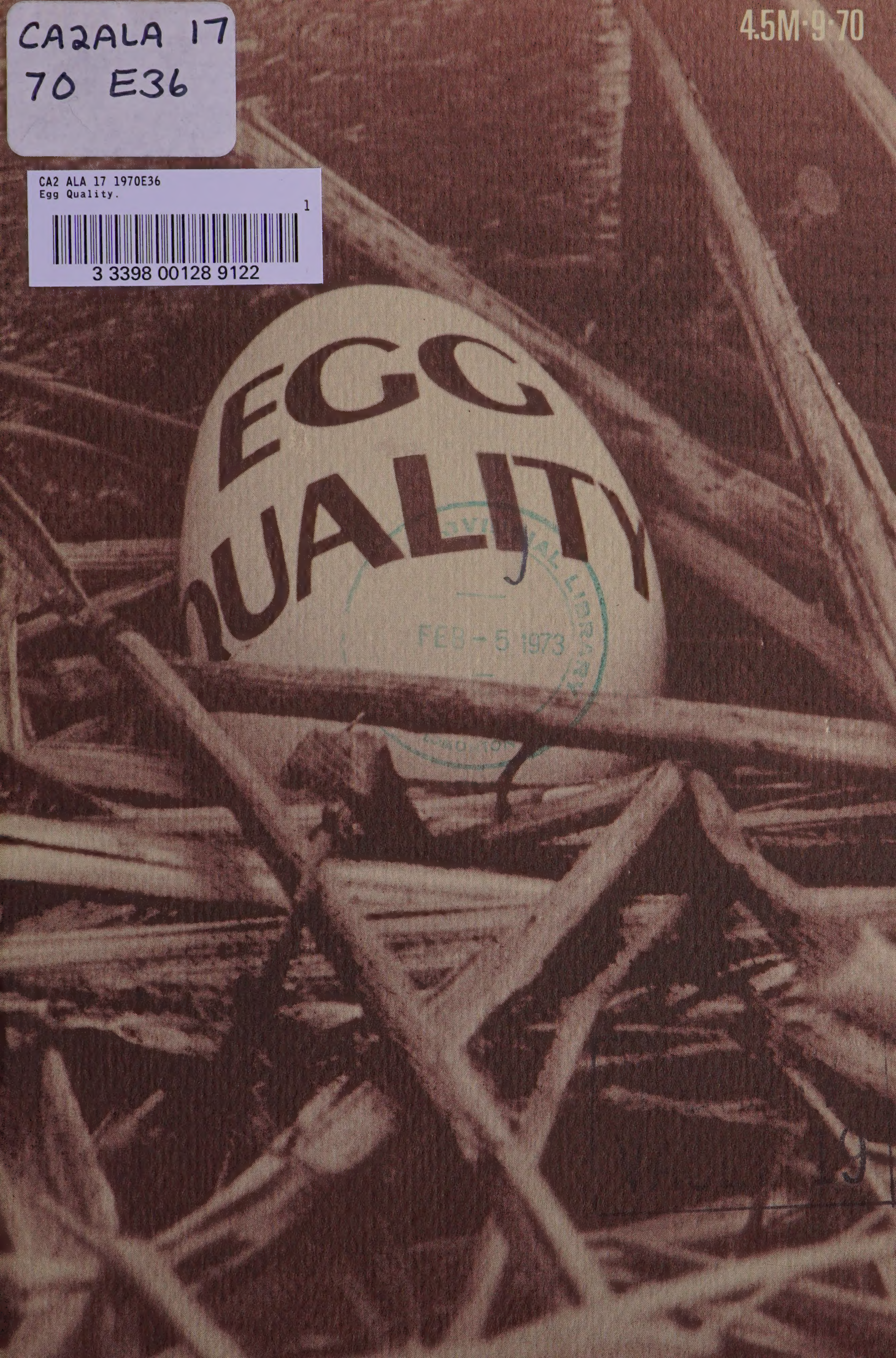
EGG QUALITY



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"EGG QUALITY"

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ALBERTA DEPARTMENT OF AGRICULTURE

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EGG QUALITY

The maintenance of quality in shell eggs is one of the major marketing problems. Fresh-laid eggs are generally of good quality with the exception of meat and blood spots. Most of the loss in quality results from the effect of the environment in which the eggs are held.

There are three factors which may affect the quality of eggs prior to their being laid. These are: (1) genetic background, (2) ration fed, (3) environment in which the hens are kept, i.e., building including ventilation, disease control, etc.

Importance of Breeding Background for Eggs:

(1) Breeding birds laying small eggs will produce layers with the same characteristic — select a strain or breed of birds capable of producing good sized eggs. Egg size is highly heritable.

(2) Egg-shell texture is considered an inherited feature that good feeding will maintain, but many layers do not lay eggs with good shells even when given the best conditions. The inability to convert these foods correctly is present, hence when selecting a strain or breed this should be considered.

(3) The internal quality of eggs is an inherited characteristic. Such as:

(a) the incidence of blood spots — select a breed or strain of birds that is free from this fault (as apart from stress factors such as rough handling of layers, loud noises, etc.).

(b) the firm white factor in eggs — this also may vary among different breeds or strains. This factor, essential if the yolk of an egg is to be held in position correctly, is a requirement of a high-quality egg.

The number of eggs does not mean everything in breeding.

Feed Affects Egg Quality:

To begin with, a flock of layers should be confined; otherwise, dark yolks and strong-flavored eggs may result from the extra green feed, etc., that the birds pick up.

(1) Shell-grit or limestone grit is required in sufficient quantity to provide calcium for poultry and an ample supply must be made available free of choice or included in the ration to enable egg shells to be produced. Also hard grit must be provided for grinding purposes, and to prevent excess consumption of shell grit in an endeavor to obtain grinding material.

(2) Sunlight or vitamin D3 is necessary for good egg-shell quality. Calcium cannot be absorbed unless sunlight or vitamin D3 is available to the birds.

(3) Manganese is very necessary for good shell quality. The production of good texture shells is not possible unless the feed contains a sufficiency of manganese. A manganese supplement is needed in some rations. Manganese is especially important for poultry kept in strict confinement.

(4) Water must be readily available and clean. One of the causes of the fall in quality of egg shells in hot weather is insufficient drinking space. Egg size is also affected. It is most important that at least 6 feet of drinking space for 100 birds be provided. It is also vital that water be kept in a clean condition at all times or the flavor and keeping qualities of the eggs will be affected.

(5) Cool sheds or buildings are necessary. Calcium is not assimilated as easily when buildings are hot. Ample ventilation is important.

Environmental Effect on Initial Egg Quality

(1) Environmental Temperature —

Egg size decreases at temperatures above 65°F and drops sharply with air temperature above 85°F. High laying house temperatures will also result in a reduction in shell quality and a decrease in thickness of shell. Some decrease may be evident at temperatures of 70° to 75° F with usually a marked effect at 80°F and a severe drop above 90°F. During hot weather feed consumption decreases and thus affects the intake of calcium and other nutrients essential for strong shells.

(2) Health of the Flock —

Infectious bronchitis, Newcastle disease, laryngotracheitis and intestinal coccidiosis cause birds to lay eggs with markedly reduced shell quality. Outbreaks of respiratory disease can be serious because poor shell quality may persist for several months after the other effects of the disease have passed and the hen apparently has returned to normal. Infectious bronchitis and Newcastle disease also cause birds to lay eggs which are misshapen, odd-shaped and heavily ridged. Albumen quality is affected by infectious bronchitis, Newcastle disease and infectious hepatitis by causing an increase in the amount of thin white. Even mild attacks of these diseases will adversely affect egg quality and this condition often continues even after recovery of full production.

Forced Molting

After some strains of layers have been in production for a period of 8 to 12 months, egg albumen quality may be improved for a time by resting the birds by means of a forced molt. The extent of the improvement appears to be associated with the length of cessation of lay, the actual quality of the eggs prior to molt, time of molt, and breed or strain. Egg quality during the post-molt period usually remains higher than that just prior to the molt for a period of 3 to 6 months. Whether a flock should be molted depends on certain economic factors, for example: cost of molting, egg size and quality desired, and the expected price of eggs during the post-molt period.

Do Not Market Fertile Eggs:

The marketing of eggs from hens that have male birds in the pens can possibly be carried out in the cold winter months, without a risk of the eggs being down-graded. There is no reason for male birds being run with laying birds at any time unless the eggs are specifically wanted for incubation purposes.

Broody Hens in Nests:

Even in cool weather, eggs deteriorate when left in nests in which hens are laying and this is accentuated in warm weather. If broody, and sitting hens are allowed to remain in the nests, with their high body temperature closely on the eggs, the breakdown in quality is rapid. Any hens showing signs of broodiness should be removed to a broody coop or another pen. This condition is more prominent in heavier breeds and presents little problem in cages.

Cracked Eggs and How to Prevent Them

1. Collect eggs carefully with properly designed wire baskets or directly into fillers.

2. Number and condition of nests. For 100 birds provide 12-16 single nests.

A community nest approximately 8 ft. long by 2 ft. wide will also be adequate for 100 birds. Also the depth of nesting material must be maintained to prevent an excess number of cracks.

3. Age of birds. Young pullets after the first month or so of production consistently lay eggs of better shell texture and thicker albumen than older birds. Hence, not only from the point of view of higher laying average, but also for better shell quality and interior quality, a high level of pullets should be maintained.

4. Frequent collection of eggs to save breakages and preserve quality. Three or four daily collections are necessary to prevent cracks and have the eggs as clean as possible.

5. Pack eggs in fillers the right way — big end up — and do not allow movement of the fillers. After eggs have been cooled properly in the egg room following collection they can be packed into the cases. The cases should be sound and well constructed to prevent movement. Do not wedge eggs into fillers. Keep bigger eggs for the top layer. Store empty cases and fillers in a cool, dry room.

Produce Clean Eggs

Production of eggs as clean as possible from the nest is essential for top-quality gradings (and saves cleaning work); therefore, it is necessary to obtain clean eggs without washing. It has been found that the process of washing removes the protective covering of the eggs and allows micro-organisms to enter the egg more readily. The degree of cleaning permitted is dry cleaning by light use of a material such as steel wool or sandpaper to remove stains. Slight stains are permitted but not heavy stains. It would be much better from an internal quality viewpoint for consumers to accept eggs with slight stains as compared to cleaner, machine washed eggs. Bacterial decomposition does not usually occur with eggs dry and clean. Wet cleaning allows the entry of bacteria (to a greater or lesser degree — according to conditions of use) that cause rots.

Factors Affecting the Retention of the Original Quality of Eggs

The percentage of top quality eggs marketed usually drops with the arrival of hot weather. However, since most newly laid eggs are of top quality, the drop in quality can be blamed primarily on poor handling of eggs.

The following factors should be observed if the original quality of eggs is to be maintained.

(1) Clean Eggs —

As mentioned earlier the production of clean eggs is important because soiled or stained eggs are down-graded. Nearly all eggs are clean at the time they are laid and good management practices are required by the producer to prevent the egg from becoming soiled or stained. These practices include keeping the wire on the bottom of the cages clean; using clean, properly adjusted, mechanical egg gatherers; providing adequate, clean nests and clean nesting material in floor pens; using clean wire baskets or fillers in gathering eggs; having clean hands when handling the eggs; keeping cracked eggs, leakers and thin-shelled eggs separate when gathering.

(2) Gathering —

Eggs should be gathered frequently — at least three or four times daily, particularly in the hot weather. Immediately after gathering, remove the eggs to a clean, cool room maintained at a temperature of 50° to 55°F.

(3) Cooling and Holding —

The cooling and holding room should be maintained at a temperature of 50° to 55°F. A walk-in cooler or refrigerated room is desirable to maintain this constant temperature. Although a cool basement may be suitable for small flocks, it is difficult to maintain the recommended holding temperature throughout the year. For flocks of 1,000 layers or under, it is probably uneconomical to have a refrigerated room but larger flocks will warrant the cost of this aid in the retention of egg quality.

(4) Humidity —

The relative humidity of the holding room should be maintained at 70 to 80 percent.

(5) Packing and Handling —

Always pack eggs in clean fillers and cases. Pack eggs large end up. Careful handling is important in conserving quality and avoiding loss.

(6) Frequent Marketing —

Marketing twice per week or oftener is essential to shorten the period between production and consumption. Frequent marketing will reduce quality loss and result in higher grades.

(7) Cleaning —

Even under ideal management practices some eggs do become soiled or dirty. Washing is the most common method used in cleaning eggs. Eggs may be washed by the producer on the farm or by the operators of a grading station. Time of egg washing will depend on the location of the operation. On the farm, washing may be done as soon as possible after gathering. The important thing is not to leave eggs sitting around in a warm place for long periods of time waiting to be washed. Either wash the eggs immediately after gathering or cool them immediately and wash later. Eggs to be cleaned at the grading station should be cooled immediately after gathering and held in a cool room until shipped or picked up. Regardless of the type of operation there are certain basic rules to be followed for correct egg washing:

(a) The room in which the washer is located must be kept clean and free of off-odors.

(b) There should be a regular daily cleanup of the entire equipment.

- (c) The temperature of the wash water should be maintained at 110° to 120°F and the eggs washed for no more than 3 or 4 minutes.
- (d) Use only sanitizer detergents which have been developed for egg washing.
- (e) The washing solution should be changed frequently.
- (f) Extremely dirty or stained eggs should be removed and either washed separately or put through the washer after the other eggs.
- (g) Eggs must be quickly dried after washing.
- (h) Eggs should be cooled immediately after washing.
- (i) Care should be taken after washing and drying to avoid recontamination of the eggs.

(8) Oiling —

Oil treating eggs with a white, odorless paraffin base mineral oil can be of considerable value in retaining egg quality by partially sealing the pores of the shell with oil.

Quality Egg Program

(1) Produce clean eggs.

(2) Feed a complete ration all the time.

(3) Produce infertile eggs after the hatching season (this would apply to producers who ship hatching eggs during part of the season).

(4) Maintain the original quality of eggs

- (a) Gather eggs three or four times daily.
- (b) Confine broody hens to coops (floor operations)
- (c) Keep eggs in a cellar, basement or egg cooler.
- (d) Maintain high humidity where eggs are held.
- (e) Cool eggs before placing them in cases.
- (f) Store empty cases and fillers in a cool, dry room.

(5) Pack and market eggs with care

- (a) Case eggs with large end up.
- (b) Place top on case when full.
- (c) Deliver eggs at least twice each week.
- (d) Protect eggs against sun and rain.
- (e) Handle carefully.

(6) Select a breed or strain for large egg size

Maintaining the quality of an egg is not solely the responsibility of the producer. The wholesaler, retailer and the consumer must also play their part, by rapid and efficient handling of eggs and proper refrigeration.

The egg is one of our most valuable foods and as such deserves proper care and handling. High nutritional value, versatility in cooking, mild, delicate flavor and ready availability characterize the egg as unique among foods.

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